HAEMOGLOBINS

Lehmann, Hermann and **Betke, Klaus** (Editors). *Haemoglobin-Colloquium*, Wien August 1961. Stuttgart, 1962. Georg Thieme Verlag. Pp. viii + 113. Price DM29.60.

IN SCARCELY ANY branch of biochemistry has recent progress been greater than in that of the human haemoglobins, and certainly in no other branch has progress done more to advance human genetics, both theoretical and practical. The chemical study of the haemoglobins has not only contributed substantially to our understanding of how the gene produces its effects, but has also helped very directly in the diagnosis of the puzzling multitude of hereditary diseases of haemoglobin synthesis.

No one could read through the present volume with any degree of understanding without being a biochemist, and without furthermore having a considerable previous knowledge of the specialized field of haemoglobin chemistry. Nevertheless, this publication is, indirectly at least, of considerable significance for eugenics.

In the introductory paper, "Haemoglobins and haemoglobinopathies," Dr. H. Lehmann briefly reviews the history of the biochemical study of the haemoglobins, stressing particularly the very great advances made since the last symposium, held in London in 1959. During the intervening period the chemical constitution of the various normal haemoglobins (of which the chief are "adult" and "foetal") had been very largely elucidated, and the differences between these and the various abnormal types very fully worked out. The author concludes:

"There is no other field of Medicine where chemical genetics have helped so much in diagnosis of disease, and we have now to look forward to the application of this new knowledge to therapy. Lorraine Kraus in Memphis has a paper in press which describes that bone marrow cells of a sickle-cell anaemia patient formed Haemoglobin A in tissue culture when normal DNA had been added to the culture medium. It is along these lines that we must hope to utilise the new knowledge for the benefit of our patients."

Perhaps the most dramatic contribution to the symposium was that of G. Braunitzer who described how he, together with his colleagues, had ascertained the complete sequences of amino acids in all the chains of the haemoglobin molecule. The precise location and nature of the abnormality is already known for thirteen abnormal haemoglobins, so it follows that these also are now fully elucidated, and join the very small group of proteins, including various insulins and whale myoglobin, for which such information is available.

In the thalassaemias no abnormal haemoglobins are present, but the production of normal haemoglobin is reduced. They are clearly closely related to the haemoglobinopathies, but their essential biochemical nature is only beginning to be understood. Now, thanks largely to work on the abnormal haemoglobins, there are prospects of a fuller understanding, as is shown in several papers in the symposium including one, by R. M. Bannerman, on "Selection in Thalassaemia" (which is followed by discussion contributions by A. C. Allison and H. Lehmann). As the editors state, the symposium "ended with the knowledge that the searching analysis of thalassaemia states will yield us in the near future an insight into physiological and pathological haemoglobin synthesis and its underlying genetical mechanisms which will be without parallel in human biology."

The inherited haemoglobin abnormalities (notably sickle-cell anaemia) and the thalassaemias are responsible for a vast amount of disease and premature death in the tropical countries of the Old World. Already for a number of years some degree of control has been possible by means of negative eugenics based on accurate diagnosis of the heterozygotes, and this must perhaps continue to be the main means of eliminating the diseases of this group. However, for the surviving sufferers, mainly the homozygotes, this has been little comfort, and effective therapy has been almost non-existent. Now, with increasing understanding, we can see at least a possibility of such therapy.

A. E. MOURANT

GROWTH

Tanner, J. M. *Growth at Adolescence.* Second Edition, Oxford, 1962. Blackwell. Pp. xiv + 325. Price 47s. 6d.

THIS VALUABLE SURVEY has been substanti-

ally enlarged for the second edition. The first edition reviewed all aspects of growth at adolescence, including (briefly) intellectual development; it also touched on earlier and later periods of growth. Now, the important topics of environmental effects, such as nutrition and illness, and of genetical influences, are dealt with for the whole period of growth. Some of the theoretical and critical treatment remains a little sketchy. For example, it is stated "that fundamentally the control of the rate of development is genetical." Strictly, rates of development, like all aspects of an organism, are "controlled" both by the environment and the genotype: it is *differences* between individuals which can properly be said to be genetically determined and, of course, only some, or some part of, those. However, the facts given after the sentence quoted above are presented with great clarity.

The chapter on "mentality and behaviour" at adolescence has been much enlarged and strengthened. This is now a most useful summary drawn, like much of the rest of the book, from a great diversity of sources. Nevertheless, some questions still arise here too. For instance, on the subject of intelligence tests, it is stated that " the correlations between scores from year to year down to about age 3 for tests *individually and properly administered* are very similar in pattern and not very much lower in magnitude than the correlations for physical measurements" (reviewer's emphasis). It would be interesting to know how many such tests meet this exacting requirement. Comments of this kind in a short review are, however, perhaps over-demanding, especially since Dr. Tanner makes many valuable critical points. As an example there is his observation that present tests of intelligence do not differentiate between a very able child on the one hand or a "precocious" child on the other; the latter might end up with only average ability.

Dr. Tanner's vast and admirable bibliography will again put many research workers in his debt. The only general suggestion I can make for his third edition is that he might add to each chapter a summary in which general conclusions and theoretical principles could be stated. In this way readers interested in the wood as much as in individual trees would be greatly helped.

S. A. B.

STERILIZATION

Ekblad, Martin. *The Prognosis after Sterilization on Social-Psychiatric Grounds. A Follow-up Study of 225 Women.* Acta Psychiatrica Scandinavica Supplementum 161. Copenhagen, 1961. Munksgaard. Pp. 162. No price stated.

STERILIZATION IN SWEDEN is governed by an Act of 1941, which however does not apply to operations for purely therapeutic reasons, such as disease of the sex organs. The grounds conceived are "eugenic," "social" and "medical," and are described by Dr. Ekblad as follows:

> Eugenic grounds exist when it can be reasonably assumed that a person will transmit to his descendants a mental disease or mental deficiency or a serious disease or defect of another kind.
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> Social grounds exist when a person is deemed, on account of mental disease, mental deficiency or other mental disorder or owing to asocial conduct, to be obviously unsuitable to have charge of children for the future. The designation "social" thus means only personal unsuitability for having charge of children and not the external circumstances in which the person lives or the social-economic conditions.
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> Medical grounds exist when, owing to disease, bodily defect or weakness, it is necessary that a woman should be sterilized in order to prevent a pregnancy which would involve serious danger to her life or health.

Sterilization on purely social - economic grounds is not permitted; but permission for the sterilization of women on grounds of "weakness" may be on the basis of social reasons in addition to purely medical ones. Under this heading come the women known as "exhausted mothers." Since the Act came into force there was an increasing number of sterilizations from 1,161 in 1942 to 2,351 in 1949, but thereafter a decline to 1,785 in 1957. Sterilizations of the male, which early on constituted about a third of the total, have in the course of time dropped to the point where they make up only about 3 per cent of the total. With time, also, there has been a change in the relative proportions of women sterilized on the three different grounds. In 1957 a total of 1,785 sterilizations were carried out, of which 1,731 were on women. Of these women 1,540 were sterilized on medical grounds. They can be subdivided into those sterilized on medical grounds in the restricted sense, and another group in which "weakness"